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AMENDMENTS TO THE SPECIFICATION:

Please replace the following numbered paragraphs with the following rewritten paragraphs:

- [2] Heavy-duty vehicles are typically equipped with a pneumatic brake actuating system. The brake actuating system applies air under pressure to a service chamber of a brake actuator, ~~to move~~ This moves a diaphragm and a push rod connected to a linkage which actuates the vehicle brakes. An emergency chamber having a power spring and a second diaphragm is often mounted on the service chamber. The emergency chamber drives the push rod and actuates the brakes to provide ~~redundant~~ failsafe braking.
- [4] Various mechanical monitoring systems have been utilized to monitor push rod stroke during actuation of the brake and provide some indication to an operator ~~as to~~ when there is an overstroke occurrence. One known mechanical system includes a brightly colored ring painted on the push rod which indicates an overstroke condition when the ring extends out of the brake actuator during actuation of the brakes. The ring may, however, become difficult to see due to the location of the brake actuators and accumulated road debris. The common usage of automatic slack adjusters which incrementally ~~adjusts~~ adjust to compensate for slack in the braking system and to decrease the required push rod movement may further complicate such a system.
- [5] Various electronic monitoring systems utilizing sensors are also conventionally utilized. Disadvantageously, linkages utilized to actuate the sensor are often complicated and may be relatively fragile. The hostile environment in which the brake actuators are mounted may also damage the electronic systems, particularly where there are exposed components.
- [8] When the push rod extends past an overstroke condition, ~~the an~~ operating shaft assembly rotates about the pivot axis to rotate a cam member attached thereto against a cam surface which extends from the indicator adjustment shaft. The cam member drives the cam surface member and ~~attached the~~ indicator adjustment shaft to overcome the

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biasing member such that the adjuster limit arm moves away from the overstroke sensor. The overstroke sensor sends a signal to a controller which provides an overstroke indication to a vehicle operator. Simultaneously, the indicator post retracts into the housing portion such that a mechanic is able to visually identify the overstroke condition in a maintenance environment.

- [9] Another indicator system includes an overstroke sensor located within the brake housing in an angular position relative to the pivot axis and adjacent a path of the operating shaft assembly. The overstroke sensor is located such that an end segment of the operating shaft assembly which ~~include~~ includes a push rod receipt pocket contacts the overstroke sensor when the operating shaft assembly has been rotated to an overstroke condition. Alternatively or additionally, a lever assembly tab extends from the lever assembly opposite the end segment to likewise contact an overstroke sensor.

- [21] Figure 1 illustrates a partial cross-sectional view of a vehicle brake assembly 10. The vehicle brake assembly 10 includes a housing 12 that may be constructed from one or more housing portions 12a, 12b. A rotor 14 is arranged near or within ~~the housing~~ portion 12b of the housing 12 and has brake pads 16, or friction elements, arranged on either side of the outer surfaces of the rotor 14.

- [22] An actuator 18, typically an air chamber, actuates a brake mechanism 30 to force the brake pads 16 into engagement with the rotor 14. The actuator 18 drives a push rod 20 through a push rod opening 21 to rotate an operating shaft assembly 22 about a pivot axis pP. The operating shaft assembly 22 includes a cam 24 having a profile 25 that cooperates with the brake mechanism 30 to drive the brake pads 16. The cam 24 is preferably received at least partially within a bearing block 26 supporting a plurality of needle bearings 28. It should be understood that various actuating systems which are operated by a lever ~~will benefit from~~ can be utilized with the present invention.

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- [23] The opening 31 of the housing which receives the brake mechanism 30 is closed off on the front side, that is, in the position facing the brake disk, by a closing plate 32 which preferably at least partially supports the brake mechanism 30. The closing plate 32 is attached to the housing portion 12a by fasteners 34 or the like. Sealing elements are preferably located upon the sealing surfaces between the closing plate 32 and the housing 12.
- [27] An overstroke indicator system 47 includes an indicator adjustment shaft 48 which mounts an indicator adjuster limit arm 50 which moves with the slack adjustment system 46 along threads 47T (Figure 4) and in response to a gear system 49 (see Figure 3) to maintain a relative position. That is, the indicator adjuster arm 50 moves along the indicator adjustment shaft 48 as the brake pads 16 wear and the slack adjustment system 46 compensates therefore (Figure 4).
- [29] A stop 56 maintains the axial position of the indicator adjustment shaft 48 against the biasing force of biasing member 52 such that an indicator post 58 extends through an aperture 60 through in the housing portion 12a. The indicator post 58 is preferably colored to assist in visual identification.
- [30] A overstroke sensor 62 such as a microswitch, reed switch or the like is mounted within the housing portion 12a to engage with the adjuster limit arm 50. When the push rod 20 (Figure 1) extends past an overstroke condition, the operating shaft assembly 22 rotates about the pivot axis pE to rotate a cam member 64 attached thereto against the cam surface member 54 (Figure 5). The cam member 64 drives the cam surface member 54 and attached indicator adjustment shaft 48 to overcome the biasing member 52 such that the adjuster limit arm 50 moves away from the overstroke sensor 62. In response to the adjuster limit arm 50 moving away from the overstroke sensor 62, sends a signal is sent to a controller (illustrated schematically at 66) which provides an overstroke indication to a vehicle operator. Simultaneously, the indicator post 58 retracts through the aperture 60 through the housing portion 12a such that a mechanic is able to visually

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identify the overstroke condition in a maintenance environment. It should be understood that either or both the mechanical and electrical indicator will benefit each brake assembly 10.

[31] Referring to Figure 6, another indicator system 68 includes an overstroke sensor 70 located within the brake housing 12a located in an angular position relative pivot axis pP adjacent a path of the operating shaft assembly 22. The overstroke sensor 70 is preferably located such that an end segment 22e of the operating shaft assembly 22 which includes a push rod receipt pocket 22p contacts the overstroke sensor 70 when the operating shaft assembly 22 has been rotated to an overstroke condition. At the overstroke condition, the overstroke sensor 70 sends a signal to a controller (illustrated schematically at 72) which provides an overstroke indication to a vehicle operator.

[32] Alternatively or additionally, a lever assembly tab 74 extends from the operating shaft opposite the end segment 22e. The lever assembly tab 74 likewise contacts an overstroke sensor 76 which sends a signal to the controller 72 when the operating shaft assembly 22 has been rotated to an overstroke condition. Notably, the sensors are schematically contained within housing portion 12a thereby protecting the sensors from road debris and other hostile environmental conditions. It should be understood that other locations ~~will also benefit from~~ can also be utilized with the present invention.

[34] The mechanical overstroke member 78 is located in an angular position relative pivot axis pP adjacent a path of the operating shaft assembly 22. When the end segment 22e of the operating shaft assembly 22 reaches an overstroke condition, the end segment 22e contacts the mechanical overstroke member 78 which buckles outward or becomes concave relative the interior of the brake housing 12a (Figure 8). The buckled mechanical overstroke member 78 is therefore readily identifiable from outside the brake housing 12a such that an operator or mechanic is readily able to visually identify that an overstroke condition has occurred. Furthermore, once the overstroke condition has been corrected, a mechanic need only press inward on the mechanical overstroke member 78 to return it to the original (Figure 7) position.